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ABSTRACT

People construct macrostructures to reduce and organize incoming semantic information. When they make a prediction on a paper's outcome based on the work's first sentence or paragraph, readers are using preliminary input to construct a macroproposition about the paper's focus. The macrostructure may be explicitly stated--either in the opening sentence or paragraph or within the text--or it may be inferred by the readers as they create links of the causal chain. Also important in the understanding of macrostructures is the idea of informativity, or the extent to which a presented text is new, unexpected, or unpredictable. A highly predictable text may be efficient for processing but cannot be effective because it stimulates little interest. Thus, both text processing and text production are complex cognitive operations requiring the construction of generalizations, abstractions, and inferences before effective communication can occur. (HOD)

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Applying Text-Processing Principles to College Writing

In recent years, researchers in reading and writing have begun to turn their attention from the processing of word and sentence-level units to the processing of larger conceptual units. This shift has drawn attention to how a reader constructs meaning while reading and can help us understand how a writer constructs meaning while producing discourse. Such understanding can provide teachers with concepts and language to use with student writers when we talk with them about taking into consideration the needs of their readers.

Researchers such as Kintsch and vanDyke have made us understand that in reading we process individual propositions to create macro-structures. What happens in the process of reading is that the information presented to the reader must somehow be reduced. The cognitive function of macro-structures, then, is to reduce and organize the incoming semantic information. A reader creates a tentative macro-structure as a working hypothesis as he or she proceeds through a text. Then, depending on whether the hypothesis is confirmed or refuted by the remainder of the discourse, the reader retains or revises the macro-structure.

This process is one commonly engaged in by students who approach revision of their papers by having their peers or teachers read their papers and respond to such questions as, from the first sentence of the paper or the first paragraph, what prediction can you make about the direction that the paper will take? Was your prediction confirmed or not? In essence, the reader is being asked to construct a macro-proposition about the major topic or focus of the paper from the preliminary input and then

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predict or hypothesize about the remainder of the discourse. If the initial macro-proposition constructed by the reader is adequate for predicting the remaining direction of the text, then the reader will have been prepared for the development that follows. If the direction taken in the text is different from the one anticipated, then there are several possible outcomes. The reader may tell the writer that he/she has been misleading the reader and should reconstruct the opening, or the reader will have to reformulate the macro-proposition as the paper develops its argument. If a sequence of sentences cannot be summarized at all, it is likely that the text does not have legitimate discourse character (van Dijk, 1977, p. 157). It is important to point out, though, that due to various cognitive factors, the actually constructed macro-structure may be different for different language users or different for the same language user in different pragmatic contexts or social situations (van Dijk, 1977, p. 147).

As Student Writing Sample A illustrates, the macro-structure for the paper may be explicitly stated in an opening paragraph. This explicit statement reduces the processing operations required by the reader and sets up a series of expectations about what will be found in the remainder of the paper. This efficiency of processing may well be the reason underlying the oft-taught direction to provide a specific thesis statement in an opening paragraph.

Student Writing Sample A. Initial macro-proposition stated explicitly permitting prediction of remainder of text.

In the era of our fathers and even grandfathers, a college education was a definite must if one wanted a fruitful and prosperous life. Prestige, status and a well paying job were the rewards of graduating with a college diploma. Yet, since the 1960's, there have been questions and doubts raised on whether a college education is actually worth the money and time. More and more people are passing up college for other careers that don't require a diploma. Even though a college education instills the chance to live on one's own and experience new people and situations, it doesn't assure a successful or worthwhile future.

In regard to the cognitive dimensions of macro-structures, it becomes clear that an ability to create generalizations is crucial to their formation. If one were to look at these operations in terms of Piaget's levels of cognitive development, it should be possible to place these operations within his stage model. In his model, Piaget indicates that concrete intellectual operations permit classifying, serializing of asymmetrical comparisons, and counting. They constitute thought processes directed entirely by encounters with circumstances (J. McV. Hunt, 1969, p. 10). But, as van Dijk and Kintsch (1978) have noted, since macro-structures can only exist with respect to more detailed levels of information, it is possible to regard the linking of propositions (containing the semantic content of sentences) into macro-propositions, i.e. the combination of several propositions into a larger relationship based on the concrete data of the individual propositions, as operations functioning within Piaget's level of concrete operations. Only when these relationships must be combined into larger conceptual units, i.e. relationships among relationships, are readers being asked to construct macro-propositions that function at the level of formal operations in Piaget's model. What this higher level demands is an examination of these relationships to determine their significance.

In Student Writing Sample B we see an example of a macro-structure rooted in concrete details. The generalization that is developed by the writer is that the two individuals discussed in the paper share a feeling of loneliness. This feeling is developed by concrete details in the experience of each person but no larger significance or concept is formulated from the presentation of the specific evidence.

Student Writing Sample B: Example of macro-structure rooted in concrete details

Ullmann and Rodriguez were constantly surrounded by people yet they felt a sort of loneliness inside. Ullmann was lonely for her past life. This life was one of simple pleasures and privacy. Ullmann was forever surrounded by reporters and cameramen but even with all these people around she felt alone. Rodriguez had the same feeling. He was always around other intellectuals and college students but he also felt alone. He longed for his family which gave him a sense of security and pride. Rodriguez had a sense of loss for his Chicano heritage. He felt guilty for abandoning it. In fact, he commented in the essay that he was only technically the person he once felt himself to be.

In Student Writing Sample C, the writer develops a relationship on a more abstract level. One aspect of the writer's life that is missing (one abstraction) is represented by a symbol (another abstraction), i.e. the daughter Linn represents the private family life that has been abandoned by Liv Ullmann and the grandmother represents the characteristics of the cultural-ethnic group that Richard Rodriguez has left behind. Each of these abstractions is then developed by specific concrete details about the individuals' lives.

Student Writing Sample C: Example of macro-structure at level of formal operations

Linn In "Changing" (by Liv Ullmann) and the grandmother in "On Becoming a Chicano" (by Richard Rodriguez) each symbolized an aspect of the writer's life which was missing. Linn, Liv Ullmann's daughter, represents the private and family life Liv abandoned for the life of a movie star. She thinks of Linn "going home to her grandmother and cousins and a white Christmas in Norway," while she is stranded in her room for a while. Linn also symbolizes her carefree and fun-loving days of youth. She remembers about her younger days and the "fiascos on cold skating rinks," Realizing "those days will never come again" she resorts to living her life on memories of the past and wishing she was "the center of her own universe again" as Liv is now. The grandmother symbolized the characteristics her grandson (Rodriguez) was lacking--age, maturity, wisdom and poise. She possessed all these qualities which he need(ed) for understanding cultural values. He refers to her as being "least assimilated" because she couldn't understand the changes in her grandson. Later, he expressed he was "assimilated into the culture of a graduate department of English." He accepted his assimilations as right but couldn't comprehend why his grandmother wouldn't change her lifestyle. That's why her face remains "solemn and still" because he doesn't try to appreciate Chicano's values, only his own.

Another important issue in the processing of text is the amount of inferencing required. In inferencing while reading a text, facts from both inside and outside (i.e. world knowledge) are used. Inferences made from outside the text proper are still part of the representation of the total (Schank, 1975, pp. 251-252).

A particularly relevant part of the concept of world knowledge and its relationship to text processing is the notion of schemas and frames. Bartlett's (1968) theoretical account of remembering invoked the concept of the "schema," an integrated, organized representation of past behavior and experience which guides an individual in reconstructing previously encountered material. In other words, the information incoming from the text will be related by the reader to some organized representation of past experience. In the process of constructing this relationship, the reader may simply be able to add the new information to the existing structures, he/she may wish to alter the existing structure on the basis of the new information, or the reader may find it necessary to radically reshape the existing schema.

According to van Dijk (1977), much knowledge may be left implicit in the discourse, due to the reader's general frame knowledge. In other words, it is essential that a discourse express at least that information which does not belong to the frame and which cannot be assumed to be known by the reader. Information which is inconsistent with the preferred or normal course of events would also have to be included in the text. In addition, the discourse would have to contain that information which permits the reader to identify the particular frame to which it should be attached. The reader would have to postulate what a normal course of events would be based on that reader's interpretation and transformation of the world (1977, p. 71).

The amount of inferencing required to represent the meaning of a paragraph will be precisely as much as will allow for the creation of a causal chain between the conceptualizations (Schank, 1975, p. 241). In other words, the readers will be creating the macro-propositions as they work their way through the text. Some of these macro-propositions will be derived from explicit relationships stated within the text, but others will have to be inferred by the readers as they create the links of the causal chain. Clearly the quality of the inferences that can be created by particular readers will be crucial to the comprehension process. If the reader is unable to construct the inference(s) required to connect the relationships of the causal chain, either because the writer has not structured the discourse so that the reader can do this, or the reader is not able to create the necessary link, perhaps because of the conceptual level required, there will be a breakdown for the reader. Closely related to this potential problem is the typical teacher comment to the student, "I know what you want to say, but you haven't said it." If in fact, the teacher "knows" what the student wanted to say because the teacher has been able to draw the necessary inferences, should the teacher be requiring the student to reach a level of explicitness which is really beyond that required for comprehension? These issues raise the obvious question, what is a reasonable level of inferencing? In other words, at what point does communication really break down? Are we as teachers demanding so much explicitness in student writing that the text quickly becomes boring for every reader? How can we make students realize that some inferencing is reasonable, but too much creates a serious breakdown in the causal chain of relationships?

In Student Writing Sample D, the writer directs the reader's attention to the "common knowledge" notion that dating normally only occurs between

two individuals at one time and that the presence of a third person makes the situation "unnatural." Without this world knowledge background, never stated explicitly in the text, the reader could make no sense of this passage. The writer, however, is confident that this information is common knowledge and knows that readers can be expected to supply the information through inferencing and thus create the connections of the causal chain of the argument.

Student Writing Sample D: Reasonable inferencing based on prior knowledge

> The power of "human nature" has not been taken into consideration by Skinner and Kinkade, which makes the ideas discussed in Walden Two and Twin Oaks very unrealistic when applied to the real society. By "human nature" I mean those feelings and emotions that we all possess, which inevitably govern our actions and attitudes in certain situations.
>
> In the society described in Walden Two, people are ruled more by intellect than by feelings. The type of society created by Skinner is a utopian system which sounds quite desirable on paper, but totally impractical in reality. Twin Oaks practices this way of life in their system of dating. It is suggested if two people care for the same person, spending time together as a trio eases problems of jealousy and rivalry. Of course, on paper, this sounds very quaint and desirable, but obviously does not apply to realistic standards. Human nature inevitably intervenes, and those involved will find it difficult, if not impossible, to carry out this foreign behavior. (Emphasis added)

In Student Writing Sample E, an unreasonable amount of inferencing is required by the readers to create the causal chain. There is an abrupt shift in topic between sentences two and three in the paragraph which requires the readers to draw on their world knowledge on a new topic for which they have not been prepared by anything in the text. The propositions of the first two sentences could reasonably lead to the formation of a macro-structure roughly dealing with the effect of smaller family sizes on the husband-wife relationship. But it is very difficult to construct a macro-structure proposition relating this concept to the economic conditions of the country unless readers are prepared by some

transitional statement indicating the significance of the relationship between family structure and economic conditions.

Student Writing Sample E: Unreasonable amount of inferencing required to create causal chain

If the usage of Birth Control increases there will be fewer ties between a husband and wife.

(The wife will have fewer children and thus she may desire to go to work.)

The wife will feel like she does not have to stay home as often, and the husband will be forced with doing the daily chores that the wife usually does herself.

(New topic raised concerning economic conditions of country and not related to content of previous sentences.)

The cost of living will force more people to work and there will be less home life.

(As a consequence of both parents having to work, no one will be available at home to take care of the children.)

The childre. will spend most of time in a daycare center or with a babysitter.

Related to the question of how much inferencing it is reasonable to expect on the part of a reader is the notion of informativity, the extent to which a presented text is new, unexpected or unpredictable (Beaugrande, 1982, p. 239). Beaugrande suggests that a highly predictable text is efficient for processing, but not effective because it stimulates little interest. Conversely, a highly unpredictable text may impose unreasonable processing demands and thereby engender confusion or resentment. Text producers, according to Beaugrande, must find a workable balance for each situation and audience.

Van Dijk points out that the basic idea of pragmatics is that when an individual is speaking or writing in certain contexts, that individual also accomplishes certain social acts. The intentions for such actions,

as well as the interpretations of intentions of actions of other participants, are based on their sets of knowledge and belief. Characteristic of communicative contexts is that these sets are different for the participants, although largely overlapping, and that the knowledge set of the "receiver" changes during the communication (i.e. "updating," to use Beaugrande's term). The sender of the communication act naturally hopes that the change will suit his/her purposes (van Dijk, 1977, pp. 218-219).

If the receiver possesses the same information that the sender possesses, there is little more than the demonstration of knowledge. A semantic act acquires a pragmatic function only if there is the additional assumption that the receiver does not possess certain knowledge (about the world, about the sender's internal state) and the purpose of the communication act is the change in the knowledge of the receiver as a consequence of the interpretation of the semantic meaning. If this purpose is realized, the sender has accomplished a successful communicative act, that is, he/she has been able to add some propositional information to the knowledge of the receiver (van Dijk, 1977, p. 219). On this definition, it would appear much assigned writing in an instructional setting is a demonstration, not an act of communication.

These points relate to the production of discourse if one starts with the idea that the writer must already have a first sketch or schema or plan available for the global/semantic organization of the discourse (van Dijk, 1977, pp. 158-159). That is, the writer will begin with the construction of a first macro-structure, at least for the beginning of the text. At later stages of production, this macro-structure may be corrected or replaced by another macro-structure (van Dijk, 1977, p. 159). According to Beaugrande, concepts are activated in the mind and mapped onto expressions

in text production and mapped back again in text reception (1980, p. 75). Spreading activation occurs when the material activated by a text contacts associated material already stored in the minds of the text producer or receiver (Beaugrande, 1980, p. 26). Van Dijk believes that the complicated cognitive problems such as complex action planning cannot possibly be accounted for at the level of linear processing of micro-information, but that hierarchial rules and categories and the formation of macro-structures are necessary (van Dijk, 1977, p. 159).

Relating these notions to the traditional ideas of topic sentence and paragraph structure, van Dijk notes that macro-structures are sometimes directly expressed as topical sentences, often at the beginning or end of a passage as the example of Student Writing Sample A illustrated. The cognitive function of such sentences is to directly provide the macro-structure of a certain passage instead of leaving the construction of the macro-structure to the reader. In other words, it facilitates comprehension (1977, p. 150). Paragraph indentations also have a macro-structural nature: they mark sentences which somehow belong together, i.e. which belong to the same topic (p. 152). Schank (1975) has noted that the representation of a paragraph is as a combination of the conceptualizations underlying the individual sentences of the paragraph plus the inferences about the necessary conditions that tie one conceptualization to another or to a given normality condition (p. 244). Schank maintains that as long as the required necessary conditions can be established and inferences necessary to complete causal chains can be resolved, a paragraph is coherent and understandable. When these processes are too difficult or impossible, problems result (p. 249). A change of topic occurs if one of the sentences of a discourse no longer "belongs to" a given topic and if the sentence

is the first member of a sequence with a different topic (van Dijk, 1977, p. 138).

The topic of the paragraph is the proposition which is dependent upon, i.e. arises out of, a joint set of propositions expressed by the sequence in the discourse (van Dijk, 1977, p. 136). Beaugrande (1980) points out that in traditional school instruction it is suggested that paragraphs should have topic sentences. But he notes that it is not the sentence that is topical, but its underlying conceptual content (p. 94). Thus for him, the efficiency of beginning with topical content lies in making obvious that which is central to the material which must be later connected (p. 94). Sentences expressing sub-topical propositions have a specific function in the cognitive processing of discourse: they either announce the topic of a passage, or, after a passage, confirm the hypothetical topic established by the reader. In this sense the other sentences may be viewed as "explicating" or "specifying" the information of the topical sentences (van Dijk, 1977, p. 136). The relationship between the topic proposition and the other propositions from which it has evolved is that it should be the smallest superset of set, i.e. integrating the information into the smallest possible frame (van Dijk, 1977, pp. 136-137).

Thus in both text processing and text production, complex cognitive operations require the construction of generalizations, abstractions and higher-level cognitive processes to permit the conceptualization and expression of acts of communication. Semantic and pragmatic factors interact when readers and writers participate in the interpretation of a text within its context.

References

Bartlett, Frederick. 1968. Remembering: a study in experimental and social psychology. Cambridge, Eng.: Cambridge University Press.

Beaugrande, Robert de. 1980. Text, Discourse and Process. Norwood, N.J.: Ablex.

_____. 1982. "Psychology and Composition: Past, Present and Future," in M. Nystrand (ed.), What Writers Know: The Language, Process and Structure of Written Discourse. New York: Academic Press, Inc.

McV. Hunt, J. 1969. "The Impact and Limitations of the Giant of Developmental Psychology," in D. Elkind and J. H. Flavell (eds.), Studies in Cognitive Development: essays in honor of Jean Piaget. New York: Oxford University Press.

Schank, Roger C. 1975. "The Structure of Episodes in Memory," in D. G. Bobrow and A. Collins (eds.), Representation and Understanding: studies in cognitive science. New York: Academic Press, Inc.

van Dijk, Teun A. 1977. Text and Context: explorations in the semantics and pragmatics of text. London: Longmans.

van Dijk, Teun A. and Kintsch, Walter. 1978. "Cognitive Psychology and Discourse: Recalling and Summarizing Stories," in W. U. Dressler (ed.), Current Trends in Text Linguistics. Berlin, New York: Walter de Gruyter.